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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,090	12/23/2003	Koichi Kondo	247087US2SRD	8096

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EXAMINER	
GEBRESILASSIE, KIBROM K	
ART UNIT	**PAPER NUMBER**
2128	

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/743,090	KONDO ET AL.	
	Examiner	Art Unit	
	Kibrom K. Gebresilassie	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/743,090.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/05/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the application filed on December 23, 2003.

2. Claims 1-16 have been examined and rejected.

Priority

3. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(a-d) or 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on March 05, 2004 is being considered.

Oath/Declaration

5. The Office acknowledges receipt of properly signed oath/declaration filed May 28, 2004.

Specification

6. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5, 8-13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by P. Aarnio, K. Koskinen, and S. Ylonen, "Using simulation during Development of Combined Manipulator and Hybrid Locomotion Platform", 6/18/2001, pages 1-8, Helsinki University of Technology, Espoo, Finland, herein referred as **Aarnio**.

As per Claim 1:

Aarnio discloses a mechanism simulation method of performing a mechanism simulation using both a dynamics simulation and a kinematic simulation, wherein in the dynamics simulation, a behavior of a mechanism is simulated using a dynamics model including a continuous system equation having a plurality of variables, and in the kinematic simulation, a geometrical operation of the mechanism is simulated using a three-dimensional mechanism model including a plurality of mechanism elements (page 1 right side column, third paragraph, lines 1-7), the method comprising: calculating a value of one of the variables of the continuous system equation by a first simulator that executes the dynamics simulation (page 3 under a title "2.2 Dynamic model" paragraphs one and two); identifying a mechanism element corresponding to a variable having the calculated value, referring to a table that represents a correspondence between the variables and the mechanism elements (page 2 left side column, lines 38-39); transmitting, to a second simulator, information specifying the identified mechanism element and the calculated value of the variable (page 4, right side column, under a title "3.2 Dynamic simulations", first paragraph); and executing the kinematic simulation by the second simulator based on the information (page 4, right side column, under a title

"3.1 Kinematic simulations" lines 1-6).

As per Claim 2:

Aarnio discloses a mechanism simulation method according to claim 1, wherein the dynamics model includes a hybrid model comprising a continuous system model (page 3, left side column, under a title "2.2 Dynamic model" lines 10-17) and a state transition model (page 3, left side column, lines 3-10), and the dynamics simulation includes a hybrid simulation ("dynamic platform model is..."; page 5, right side column, 40-43).

As per Claim 3:

Aarnio discloses a mechanism simulation method according to claim 1, wherein the state transition model inputs a control signal from an external mechanism control software system (page 6, right side column, lines 5-15).

As per Claim 4:

Aarnio discloses a mechanism simulation method according to claim 1, wherein the mechanism elements include a rotation angle or displacement of an actuator (page 2 under a title "2.1 Kinematic model" lines 1-5).

As per Claim 5:

Aarnio discloses a mechanism simulation method according to claim 1, further comprising: reading data representing the variables of the dynamics model (page 3, left side column, under a title "2.2 Dynamic model" lines 1-6); reading data representing the mechanism elements of the three-dimensional mechanism model (page 2, right side column, under a title "2. Simulation Model" third paragraph); extracting, from the data

representing the variables (page 3, left side column, under a title "2.2 Dynamic model" lines 1-6), a plurality of selective variables each of which enables to be associated with any one of the mechanism elements (page 4, right side column, under a title "3.1 Kinematic simulations" lines 4--6); extracting, from the data representing the mechanism elements (page 3, left side column, under a title "2.2 Dynamic model" lines 1-6), a plurality of selective mechanism elements each of which enables to be associated with any one of the variables (page 4, right side column, under a title "3.1 Kinematic simulations" lines 4--6); and receiving a selection which is made by a user and is indicative of a combination of one of the plurality of selective variables and one of the plurality of selective mechanism elements, to generate the table based on the selection (page 1, right side column, lines 31-32 and continue to page 2 left side column, lines 1-3).

As per Claim 8:

Aarnio discloses a mechanism simulation method according to claim 5, further comprising storing the generated table to a file ("During simulation..."; page 5, right side column, lines 9-11).

As per Claim 9:

The limitation of claim 9 has already been discussed in the rejection of Claim 1. It is therefore rejected under the same rationale.

As per Claim 10:

The limitation of claim 10 has already been discussed in the rejection of Claim 2. It is therefore rejected under the same rationale.

As per Claim 11:

The limitation of claim 11 has already been discussed in the rejection of Claim 3. It is therefore rejected under the same rationale.

As per Claim 12:

The limitation of claim 12 has already been discussed in the rejection of Claim 4. It is therefore rejected under the same rationale.

As per Claim 13:

The limitation of claim 13 has already been discussed in the rejection of Claim 5. It is therefore rejected under the same rationale.

As per Claim 16:

The limitation of claim 16 has already been discussed in the rejection of Claim 8. It is therefore rejected under the same rationale.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 6, 7, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over P. Aarnio, K. Koskinen, and S. Ylonen, "Using simulation during Development of Combined Manipulator and Hybrid Locomotion Platform", 6/18/2001, pages 1-8, Helsinki University of Technology, Espoo, Finland, herein referred as **Aarnio,** as applied to claims 1-5, 8-13, and 16 above, and further in view of V. Gupta, R. Jagadeesan and V. A. Saraswat, "Computing with continuous change" Dept. of Mathematical and Computer Science, Loyola University-Lake Shore Campus, Chicago, IL 60626, 7 May 1999, pages 1-53, herein referred as **Gupta**.

As per Claim 6:

Aarnio fails to discloses selecting a class to which the selective variables belong, and selecting a member variable in the class.

Gupta discloses selecting a class to which the selective variables belong, and selecting a member variable in the class (the table in page 10).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Aarnio related to how 3D graphical simulation model of the work Partner robot is build and how it is used in the development process of the robot platform with the teachings of Gupta related to the design and investigation of a paradigm, Hybrid Concurrent Constraint programming or Hybrid cc, for the modeling, programming and analysis of hybrid systems. The

motivation for doing so would have been more convenient to have an integrated theory by presenting a recipe for the construction of continuous programming languages-languages in which state dynamics can be described as differential equation (Abstract lines 5-7). Hence a skilled artisan having access to the teaching of Aarnio and Gupta would have knowingly modified the teaching of Aarnio with Gupta.

As per Claim 7:

Gupta discloses a mechanism simulation method according to claim 5, wherein data of the dynamics model includes a description data described in a hybrid model language (Abstract lines 9-11).

As per Claim 14:

The limitation of claim 14 has already been discussed in the rejection of Claim 6. It is therefore rejected under the same rationale.

As per Claim 15:

The limitation of claim 15 has already been discussed in the rejection of Claim 7. It is therefore rejected under the same rationale.

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

P. Aarnio, K. Koskinen, and S. Salmi, "Simulation of the Hybtor Robot" Information and computer Systems in Automation, Helsinki University of Technology.

F. Bullo, and M. Zefran, "Modeling and Controllability for a Class of Hbrid Mechanical Systems", IEEE Transactions on Robotics and Automation, Vol. 18, No. 4, August 2002.

US Patent No. 6,191,798 issued to Handelman et al.

US Patent No. 6,873,947 issued to Huang et al.

US Patent No. 6,445,964 issued to White et al.

US Patent No. 5,754,023 issued to Roston et al.

2. Any inquiring concerning this communication or earlier communication from the examiner should be directed to Kibrom K. Gebresilassie whose telephone number is (571) 272-8571. The examiner can normally be reached on Monday-Friday, 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner supervisor, Kamini shah can be reached at (571) 272-2279. The official fax number is (571) 273-8300. Any inquiring of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is (571) 272-3700.

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KAMINI SHAH
SUPERVISORY PATENT EXAMINER